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| 09/558,434 | 04/25/2000 | Kurt Spears | 10001388-1 | 8378 |

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| EXAMINER |
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JERABEK, KELLY L

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| ART UNIT | PAPER NUMBER |
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2612

DATE MAILED: 07/01/2004

#8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/558,434

Applicant(s)

SPEARS ET AL. 

Examiner

Kelly L. Jerabek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION***Response to Arguments***

Applicant's arguments filed 4/29/2004 have been fully considered but they are not persuasive.

Response to Remarks:

Applicant contends (Amendment, page 1) that the Pool reference does not teach or suggest exposing the array of photosensors to light from the image again; dumping the first portion of charges from the array of photosensors; and shifting the second portion of charges from the array of photosensors to the amplifier. The Examiner respectfully disagrees. Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A first portion of charges (42) from the array of photosensors is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a second portion of charges (44) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). Pool also states that image data may be read out of register (44) and "dark current" charge may be dumped from register (42) into the sink (54) (col. 4, lines 2-4). Therefore, the first portion of charges (42) may be dumped and the second portion of charges (44) may be shifted to the amplifier. As far as exposing the array of photosensors to light from the image again, the

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examiner takes Official Notice that it is well known in the art for imaging sensors to be exposed to light during different intervals. The invention according to Pool provides a CCD including an imaging section in which pockets of charge are produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines 61-64). The pockets of charges in the image section are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since the pockets of charges are formed by light incident on an imaging sensor (CCD) it would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor (CCD) disclosed by Pool to be exposed to light on several different occasions. Doing so would provide a means for either reading out or dumping pockets of charge produced by light incident on an imaging device for a CCD that is exposed multiple times (col. 2, lines 41-64).

Applicant contends (Amendment, page 2) that the last two elements of claim 1 specify that **after the second exposure**, different charges are converted than for the first exposure, and also that different charges are dumped. The Examiner respectfully disagrees. Claim 1 does not specify that the dumping of the first portion of charges from the array and the shifting of the second portion of charges from the array must be performed after the second exposure. The claim states that the array of photosensors is exposed to light from the image again.

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However, although the last two elements are mentioned after the mention of the second exposure of the array, the claim fails to make a connection between the dumping of the first portion of charges from the array, the shifting of the second portion of charges from the array, and the step of exposing the array of photosensors to light from the image again.

Applicant contends (Amendment, page 2) that the examiner has provided no suggestion or motivation as to why one would modify Pool to expose a second time. Furthermore, applicant contends that modification by double exposure would render Pool unsatisfactory for its intended purpose, which is time delay integration. The Examiner respectfully disagrees. Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A first portion of charges (42) from the array of photosensors is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a second portion of charges (44) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). Pool also states that image data may be read out of register (44) and "dark current" charge may be dumped from register (42) into the sink (54) (col. 4, lines 2-4). Therefore, the first portion of charges (42) may be dumped and the second portion of charges (44) may be shifted to the amplifier. As far as exposing the array of photosensors to light from the image again, the examiner takes Official Notice that it is well known in the art for imaging sensors to be exposed to light during different intervals. The invention according to Pool provides a CCD including an imaging section in which pockets of charge are

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produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines 61-64). The pockets of charges in the image section are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since the pockets of charges are formed by light incident on an imaging sensor (CCD) it would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor (CCD) disclosed by Pool to be exposed to light on several different occasions. Doing so would provide a means for either reading out or dumping pockets of charge produced by light incident on an imaging device for a CCD that is exposed multiple times (col. 2, lines 41-64). Modification of the Pool reference would not render it unsatisfactory for its intended purpose. The invention disclosed by Pool includes a CCD including an imaging section in which pockets of charge are produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines 61-64). The pockets of charges in the image section are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since the pockets of charge according to the invention are produced by the incidence of light on the device, modification by double exposure would merely provide a repeated source of incident light to produce pockets of charge.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1,4, and 5 rejected under 35 U.S.C. 103(a) as being anticipated by Pool US 5,308,970.

Re claim 1, Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A first portion of charges (42) from the array of photosensors is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a second portion of charges (44) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). Pool also states that image data may be read out of register (44) and "dark current" charge may be dumped from register (42) into the sink (54) (col. 4, lines 2-4). Therefore, the first portion of charges (42) may be dumped and the second portion of charges (44) may be shifted to the amplifier. As far as exposing the array of photosensors to light from the image again, the examiner takes Official Notice that it is well known in the art for imaging sensors to be exposed to light during different intervals. The invention according to Pool provides a CCD including an imaging section in which pockets of charge are produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines

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61-64). The pockets of charges in the image section are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since the pockets of charges are formed by light incident on an imaging sensor (CCD) it would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor (CCD) disclosed by Pool to be exposed to light on several different occasions. Doing so would provide a means for either reading out or dumping pockets of charge produced by light incident on an imaging device for a CCD that is exposed multiple times (col. 2, lines 41-64).

Re claim 4, the examiner takes Official Notice that it is well known in the art for imaging sensors and the images that they are capturing to both stay stationary between the steps of exposure. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor of Pool to capture multiple images in which there was no relative movement between the array of photosensors and the image between the steps of exposing.

Re claim 5, the examiner takes Official Notice that it is well known in the art for either the imaging sensors or the images that they are capturing to move between the steps of exposure. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor of Pool to capture multiple images in which there was relative movement between the array of photosensors and the image between the steps of exposing.

**Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over
Pool in view of Hashimoto et al. US 4,689,686.**

Pool teaches a CCD with bi-directional readout as in claim 1, but does not state that the step of dumping consists of shifting charges from the array of photosensors at a shift rate that is higher than a normal shift rate.

Hashimoto discloses an image pickup apparatus (fig. 2). The image pickup apparatus includes a drive circuit (36) for setting the readout speed to be higher than the standard readout speed (col. 7, lines 55-65). Therefore, it would have been obvious for one skilled in the art to have been motivated to include a drive circuit that increases the shift rate of the photosensor array as taught in Hashimoto in the bi-directional CDD disclosed by Pool. Doing so would provide a means for obtaining object information in a short time with low electric power consumption (Hashimoto: col. 2, lines 20-23).

**Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over
Pool in view of Watanabe et al. US 6,351,284.**

Pool teaches a CCD with bi-directional readout as in claim 1, but does not state that the step of dumping consists of discharging, simultaneously, a portion of charges from the array of photosensors.

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Watanabe discloses a method and apparatus for driving a solid-state image sensor. The disclosed solid-state image sensor includes individual light-receiving pixels that can be simultaneously discharged (col. 2, lines 26-31). Therefore, it would have been obvious to include an array of photosensors that can be simultaneously discharged as taught in Watanabe in the bi-directional CDD disclosed by Pool. Doing so would provide an alternate means for transferring charge packets in an image sensor (Watanabe: col. 1, lines 6-11).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contacts


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly L. Jerabek whose telephone number is 703-305-8659. The examiner can normally be reached on Monday - Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for submitting all Official communications is 703-872-9306. The fax phone number for submitting informal communications such as drafts, proposed amendments, etc., may be faxed directly to the Examiner at 703-746-3059.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KLJ


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